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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,816	03/23/2001	Shih-Jong J. Lee	SV10	6695

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EXAMINER

PATEL, SHEFALI D

ART UNIT PAPER NUMBER

2621

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/815,816

Applicant(s)

LEE ET AL.

MN

Examiner

Shefali D Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12, 14-18, 20 and 21 is/are rejected.
- 7) ☒ Claim(s) 6, 13 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Figure 5 elements 5200 and 5210; Figure 6 elements 1004, 1006, 1008; Figure 9 element 5406; Figure 10 elements 2404, 2406, 2408, 2410, 2410, etc.; Figure 12B elements 412, 414, 416, 418, 10, and 420 are not in the specification. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to because in figure 10, element 2422 does not directly point to anything. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 1 is objected to because of the following informalities: step b. does not end with a semicolon (“;”) and claim 1, at step d., does not end with a period (“.”). Please end claim 1 with a period and insert semicolon at the end of step b. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Muraoka (US 5,446,542).

With regard to **claim 14** Muraoka discloses a. obtaining an image of at least one mark (image of the mark 6A, 6B, and 6C by the image sensor 12 as seen in Figures 1A-1C and col. 3 lines 15-29); b. locating the center of each mark based on symmetry (center is located as seen in Figures 1D-1F, see, col. 3 lines 20-23, col. 3 lines 51-56, and col. 5 lines 55-58); c. measuring the mark orientation using a structure guided estimation process (the position of the mark is determined by two different structure estimation process as seen at col. 4 lines 54-68 to col. 5 lines 1-26).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 4-5 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraoka (US 5,446,542).

With regard to **claim 1** Muraoka discloses a method for detecting the mark in an image (col. 3 lines 4-12) comprising: a. obtaining an image of at least one mark (image of the mark 6A, 6B, and 6C by the image sensor 12 as seen in Figures 1A-1C and col. 3 lines 15-29); b. locating the center of each mark based on symmetry (center is located as seen in Figures 1D-1F, see, col.

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3 lines 20-23, col. 3 lines 51-56, and col. 5 lines 55-58); c. processing the mark image using at least one (directional elongated) filter (i.e., filter 8, see col. 3 lines 30-33 and col. 4 lines 14-19); d. rejecting artifacts based on symmetry (image processor 13 decides whether or not a plurality of light intensity distribution are substantially in symmetry. See, col. 3 lines 45-61). Muraoka discloses a spatial filter 8 and does not expressly disclose directional elongated filter. It would have been obvious matter of design choice to modify the Muraoka reference by having directional elongated filter since applicant has not discloses that having directional elongated filter solves any stated problem (pages 4-5 of the specification) or is for any particular purpose (other than to eliminate noise) and it appears that the spatial filter would perform equally well with processing the mark image and rejecting artifacts based on the symmetry (as disclosed in Muraoka col. 3 lines 30-41).

With regard to **claim 4** Muraoka with reference to a design choice discloses at least one parameter of the directional elongated filter is determined by learning (obtaining the size and the shape of the alignment mark 6A at col. 4 lines 12-19 and col. 6 lines 27-37).

With regard to **claim 5** Muraoka does not expressly discloses having a directional elongated filter used to extract a feature of the mark. However, Muraoka discloses a filter as disclosed in claim 1 above, and the arguments are not repeated herein, but are incorporated by reference.

With regard to **claim 21**, Muraoka discloses all of the claimed subject matter as already discussed above in paragraph 5 above and the arguments are not repeated herein, but are incorporated by reference. Claim 21 distinguishes from claim 1 only in that it recites determining at least one parameter of the mark through a learning process. Muraoka discloses

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obtaining the size and the shape of the alignment mark 6A at col. 4 lines 12-19 and col. 6 lines 27-37.

8. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraoka in view of Ina (US 4,886,974).

With regard to **claim 2** Muraoka discloses obtaining the mark depending on the size and the shape as discussed above in claim 1. Muraoka does not expressly disclose a step of classifying mark type. Ina discloses this as a prior art at col. 1 lines 33-45. Muraoka and Ina are combinable because they are from the same field of endeavor, i.e., detecting a mark position with its center. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Ina with Muraoka. The motivation for doing so is to obtain the positional information as disclosed in Ina at col. 1 lines 40-42 and 44-45. Therefore, it would have been obvious to combine Ina with Muraoka to obtain the invention as specified in claim 2.

With regard to **claim 3** it is clear from Ina that the process of classifying is through a sequential process (See, col. 1 lines 33-45 where the patterns with large width and a narrow width are obtained in an order).

9. Claims 7-12,^{15-18, and 20}~~and 15-20~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraoka in view of Handley (US 6,141,464).

With regard to **claim 7** Muraoka discloses locating a detected mark's position in an image along each axis of symmetry as disclosed above in claim 1. Muraoka also discloses masking portions of the image based upon detected mark elements (filter 8 masks only the

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regular reflected light reflected from the center flat surface 61 of the alignment mark 6A. See, col. 3 lines 30-41); estimating mark position using a structure guided estimation process (the position of the mark is determined by two different structure estimation process as seen at col. 4 lines 54-68 to col. 5 lines 1-26). Muraoka does not expressly disclose creating a gray scale image of at least one mark. Handley discloses this at col. 4 lines 45-46. Muraoka and Handley are combinable because they are from the same field of endeavor, i.e., detecting a mark position with its center. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Handley with Muraoka. The motivation for doing so is to obtain the difference between the marker and the background spectral reflectance by means of a simple intensity decision as disclosed in Handley at col. 4 lines 58-67 to col. 5 lines 1-15. Therefore, it would have been obvious to combine Handley with Muraoka to obtain the invention as specified in claim 7.

With regard to **claim 8** Handley discloses detected mark elements determining the constraints applied to the structure guided estimation process at col. 5 lines 3-15.

With regard to **claim 9** it is clear from Muraoka's invention that the inner/outer marks position are sequentially determined as seen in Figures 1D-1F and it's respective portions in the specification.

With regard to **claim 10** Muraoka discloses portions of a mark are being excluded from the estimation of mark position based upon detection results (image processor 13 decides whether or not a plurality of light intensity distribution are substantially in symmetry. See, col. 3 lines 45-61).

With regard to **claim 11** Muraoka discloses a weight image to emphasize particularly important or definitive portions of the mark by emphasizing the shape and the size of the position of the mark at col. 4 lines 12-25.

With regard to **claim 12** Muraoka discloses the weight image is being learned at col. 4 lines 26-36 where the image is being learned by the use of image sensor 12 and an image processor 13.

Claim 15 recites identical features as claim 8. Thus, arguments similar to that presented above for claim 8 is equally applicable to claim 15.

Claim 16 recites identical features as claim 9. Thus, arguments similar to that presented above for claim 8 is equally applicable to claim 16.

Claim 17 recites identical features as claim 10. Thus, arguments similar to that presented above for claim 8 is equally applicable to claim 17.

Claim 18 recites identical features as claim 11. Thus, arguments similar to that presented above for claim 8 is equally applicable to claim 18.

Claim 20 recites identical features as claim 12. Thus, arguments similar to that presented above for claim 12 is equally applicable to claim 20.

Allowable Subject Matter

10. Claims 6, 13, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The closest prior art to Muraoka and Ina are directed to a method for detecting the mark in the an image comprising obtaining an image of at least one mark, locating the center of each mark based on symmetry, processing the mark image using at least one directional elongated filter and rejecting artifacts based on the symmetry as disclosed in claims 1, 7, 14, and 21. However, the closest prior art fails to disclose anything about the method wherein features for classification of mark type are selected from a group consisting of curvature of an arc, intersection angle of lines, relative position of lines, relative angle between lines, direction of symmetry axes, parallelism, projection of detected marks to the symmetry axes, and orthogonality of lines as disclosed in claim 6. Further, the closest prior art fails to disclose the method wherein the constraints are selected from a group consisting of parallel lines, perpendicular lines, rings, circles, arcs, line length, intersection angle of lines, and line width as disclosed in claims 13 and 19. It is for these reasons in combination with all the other elements of the claim that claims 6, 13, and 19 would be allowable if rewritten in independent form including all of the limitation of the base claim and any intervening claims.

Conclusion


11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,398,292; US 6,628,406; US 6,606,145; US 5,400,135.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali D Patel whose telephone number is 703-306-4182. The examiner can normally be reached on M-F 8:30am - 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


DANIEL MARIAM
PRIMARY EXAMINER
February 25, 2004

Shefali D Patel
Examiner
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